

REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-5, 7, 8, 12, 15-19, 22, 24-29, 31-36, and 39-49 are in this case. Claims 1-5, 7, 8, 12, 15, 25-29, and 44-49 have been allowed. Claims 16 and 31 have been rejected under 35 USC § 102(e). Claims 17-19, 22, 24, 32,-36, and 40-43 have been objected to.

While respectfully traversing the Examiner's objections to claims 16 and 31, in order to expedite the prosecution, new independent claims 50, 51, 52, and 53 have been introduced respectively incorporating original claims 16 and 17, 16 and 24, 31 and 32, and 31 and 34, and a new dependent claim 54 depending from claim 31.

Claims 17, 24, 32, and 34 have, as a consequence, been cancelled.

Independent claims 29, 40, 41, and 43 and dependent claims 12, 22, and 34 have been amended.

The claims before the Examiner are directed toward a method and system for finding the position of a mobile unit with respect to beacons such as the satellites of a satellite network, like the Global Positioning System. Each beacon transmits a signal that consists of a series of frames of a pseudo-noise sequence. The frames of a received signal are arranged as columns of a matrix and are processed coherently to provide estimated pseudo-ranges and estimated rates of change of pseudo-ranges for beacons in view. The coherent processing includes performing an orthogonal transform on the rows of the matrix, multiplying the elements of the matrix by Doppler compensation factors, and then, for each beacon in view, convolving the columns of the matrix with the pseudo-noise sequence of that beacon.

§ 102(e) Rejection — Haartsen, US Patent 6,028,853

The Examiner has rejected claim 16 under §102(e), as being anticipated by Haartsen, US Patent N° 6,028,853 (henceforth “Haartsen”). The Examiner’s rejection is respectfully traversed.

The current invention is of a method to determine a pseudo-range and a rate of change thereof to a beacon. By contrast, Haartsen discloses a method and arrangement for making more effective use of radio-frequency spectrum by synchronizing, in an *ad hoc* network, a multiple of radio-transceiver arrangements with different characteristics that make use of a common air interface. There is no mention, whatever, in Haartsen of determination of a pseudo-range and a rate of change thereof.

Haartsen multiplies a pulse signal by a PN sequence as instanced by the Examiner (col.8, lines 2-10 and col.12, lines 20-24), prior to transmission, thereby converting it to a broad-band signal in order to cope with Rayleigh fading due to multi-path effects. Autocorrelation with a matching PN sequence subsequent to reception helps to counter Rayleigh fading and extract the desired synchronization pulses. By contrast, in the present invention the PN sequences are the basic signals; they identify the source transmitter by being characteristic of the particular transmitter and are sufficiently mutually orthogonal to enable mutual discernment. The several basic PN sequences are each modulated by identical data messages that characterize the particular system and provide information on timings and transmitter locations, *inter alia*. This is an inverse of what is disclosed by Haartsen.

The mathematical similarity of multiplication of or by a PN sequence and subsequent correlation as disclosed in the two inventions arises from using a technique common in digital signal processing and does not, of itself, imply identity;

its presence tends to dilute the real differences between the current invention and that of Haartsen and obscures the fact that the former is far from obvious from the disclosure of the latter. Added to this that Haartsen's goal is different that there is no hint in Haartsen of the problem that is solved by the present invention, or that Haartsen is in any way relevant thereto, it cannot be said that the present invention is obvious from Haartsen.

Applicant therefore believes that independent claim 16 is in condition for allowance in its present form.

§ 102(e) Rejections — Haardt *et al*, US Patent 6,353,731 B1

The Examiner has rejected claims 31-33 under §102(e) as being anticipated by Haardt *et al*, US Patent N° 6,353,732 B1 (henceforth "Haardt"). The Examiner's rejection is respectfully traversed.

As in the case of Haartsen, Haardt is only superficially similar to the present invention. Again, the similarities arise from the employment of some techniques commonly used in the art, such as digitizing received signals for computation, conversion to the frequency domain for computational ease, matched filtering for improving signal-to-noise ratio, and convolution to extract wanted information. In this case, the differences arise from the qualitative differences between the data processed in the respective inventions, as well as the final respective products.

Haardt is concerned with measuring the characteristics of radio channels by determining the direction of incidence and delay of signals received *via* different channels from a single transmitter by an array of receivers (Abstract) and processing the signals by standard techniques.

The present invention, by contrast, seeks to locate a single, mobile receiver in relation to a number of transmitters having known locations and transmission signals

and schedules by measuring the receiver's distance from the transmitters and triangulating, and to do that in minimal time.

The Examiner notes that Haardt discloses the step of receiving a signal but does not point out that Haardt's reception is by a plurality of sensors arranged in a linear array (col.3, lines 3-4). It is essential that there be more than one sensor since the incidence direction of an arriving signal element is measured (col.1, line 19). By contrast, the present invention does not relate to any plurality of sensors. Support for new claim 54 is found in figure 1, which shows only a single antenna 12 for position determination, for receiving RF signals transmitted by GPS satellites (antenna 24 is for data exchange with base stations).

According to the Examiner, Haardt discloses "applying a matched filter algorithm to said digitized signal to extract the pseudo-range and rate of change of the pseudo-range". Haardt, however, while using similar standard signal-processing techniques, does not seek to determine a pseudo-range and rate of change of the pseudo-range. Moreover, Haardt makes no mention anywhere of a pseudo-range and rate of change of the pseudo-range. Instead, Haardt proceeds to determine an angle of incidence of a signal arriving at an array of receivers. Applicant submits that the present invention of determining a pseudo-range and a rate of change of the pseudo-range is, as a consequence, not obvious from Haardt.

In view of this, Applicant maintains that Haardt has not anticipated the present invention and that claims 31-33 are in a condition for allowance in their present form.

Allowable subject matter

The Examiner has objected to claims 17-19, 22, 24, 32-36 and 40-43 as being dependent upon a rejected base claim. The Examiner has noted that claims 17-19, 22,

24, 32-36, and 40-43 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In view of the discussion above in the context of the § 102(e) rejections, Applicant submits that the base claims from which claims 17-19, 22, 24, and 32-36 depend are allowable, making these claims allowable in their present form.

Nevertheless, in order to expedite the prosecution, Applicant has added new claims, as discussed below under "Claim Objections".

Claims 40, 41, and 43 are already independent claims. They are not, as the Examiner states, based on a rejected base claim but did require stylistic amendments. These amendments have been made, as detailed below, and Applicant submits that they are now allowable in their amended form. The amendment of claim 41 resolves the objection to dependent claim 42, which is now also in a condition for acceptance.

Claim Objections

The Examiner has objected to claims 17-19 as being based upon a rejected base claim and has noted that these claims would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. The Examiner's objection is respectfully traversed. It is demonstrated above that claim 16 is allowable in its present form. Nevertheless, in order to expedite the prosecution, applicant has added new independent claims 50, incorporating original claims 16 and 17, and 51, incorporating old claims 16 and 24, in order to clarify and emphasize the crucial distinctions between the device of the present invention and the device of the Haartsen patent cited by the Examiner and in the manner suggested by the Examiner.

New independent claims 50 and 51 now feature language that makes it absolutely clear that the device of the present invention is not obvious from prior art.

Applicant believes that these new claims completely overcome the Examiner's rejections on § 102(e) grounds.

The Examiner has objected to claims 32-36 as being based upon a rejected base claim. The Examiner has noted that these claims would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. The Examiner's objection is respectfully traversed. It is demonstrated above that claim 31 is allowable in its present form. Nevertheless, in order to expedite the prosecution, applicant has added new independent claims 52, incorporating original claims 31 and 32, and 53, incorporating original claims 31 and 34, in order to clarify and emphasize the crucial distinctions between the device of the present invention and the device of the Haardt patent cited by the Examiner and in the manner suggested by the Examiner. Additionally, a new claim 54 depending from claim 31 has been added reciting a single sensor limitation to claim 31 in order further to distinguish the present invention from prior art cited by the Examiner.

New independent claims 52 and 53, and dependent claim 54, now feature language that makes it absolutely clear that the device of the present invention is not obvious from prior art. Applicant believes that these new claims completely overcome the Examiner's rejections on § 102(e) grounds.

Claims 40 and 41 have been objected to because of the following informalities: in line 21, after "and" delete "." respectively.


Claim 43 is objected to because of the following informalities: in line 22, replace "matrices" with "matrix".

We thank the Examiner for drawing attention to these typographical errors. They have been amended, together with other typographical errors and some numbering errors in claims 12, 22, 29, 41, 43, and 48.

No new matter has been added.

In view of the above amendments and remarks it is respectfully submitted that independent claims 16, 31, 40-41 and 43, and hence dependent claims 17-19, 22, 24, 32-36, and 42 are in condition for allowance. Similarly, it is respectfully submitted that correction of informalities drawn to attention by the Examiner in claims 40-41, and 43 as well as typographical and numbering errors in claims 12, 22, 29, 41, 43, and 48 render these in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



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